

Atmospheric Chemistry and Health Effects of Metal-Containing Aerosols

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Introduction

The main focus of this work is in better understanding the environmental and health effects of metal-containing atmospheric particles through laboratory studies. Metal-containing atmospheric aerosols include naturally occurring mineral dust, fly ash and engineered nanomaterials have important impacts in atmospheric chemistry and human health. Additionally, atmospheric processing of metal-containing particles through heterogeneous chemical and photochemical reactions will modify particle properties and thus alter how these particles impact atmospheric chemistry and health.

Approach

Using a combined approach of applying state-of-the-art characterization of metal-containing particles with measurement of environmental and health impacts, laboratory studies can provide a conceptual framework from which to understand the impacts of metal-containing atmospheric particles.

Discussion of Results

This talk will focus will be on recent studies and results that correlate materials properties for several metal-containing atmospherically relevant particles including mineral dust, coal combustion fly ash and engineered nanomaterials with their impact on atmospheric chemistry and health. The role of iron in these particles is of particular interest and a correlation of the role of iron solubility with atmospheric chemistry and health effects is shown in several cases [1,2].

[1] Chen *et al* (2012) *Env. Sci. & Tech.* **46**, 2112-2120. [2] Borcharding *et al* (2013) *PLOS ONE* **8**, e57673, doi:10.1371/journal.pone.0057673.